

Forces and Motion

5-5 The student will demonstrate an understanding of the nature of force and motion. (Physical Science)

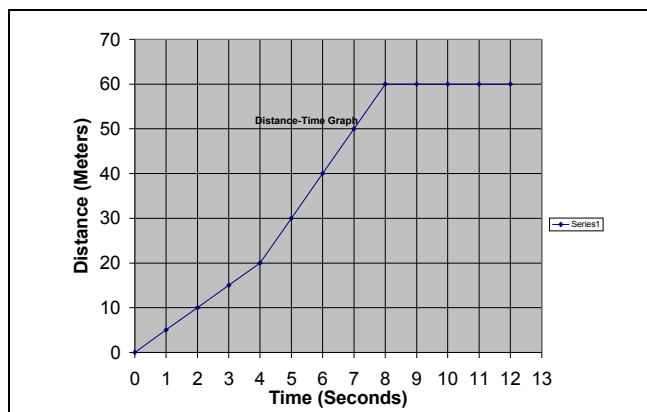
5-5.5 Use a graph to illustrate the motion of an object.

Taxonomy level: 3.2-B, C Apply Procedural and Conceptual Knowledge

Previous/Future knowledge: Students have not been introduced to the concept of using a graph to illustrate motion of an object in previous grades. Students will further develop the concepts of graphing motion in 8th grade (8-5.1).

It is essential for students to construct a distance-time graph to illustrate the motion of an object. For example, given the following data collected from a moving object:

Time (Sec)	Distance (meters)
0	0
1	5
2	10
3	15
4	20
5	30
6	40
7	50
8	60
9	60
10	60
11	60



Distance-Time Graph

To construct a distance-time graph, follow the correct procedures for producing a graph:

- Correct placement of dependent and independent variables (DRY-MIX)
- Correct labeling of the axes
- Title the graph
- Correct placement of intervals

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It is essential for students to interpret the motion of an object from studying a distance time graph, including:

- The total distance that the object has traveled after a certain amount of time
- The distance that the object travels during a particular time interval
- Determine if the object is moving or stationary during a particular time interval
- Compare the motion of the object during two time intervals (Based on the shape of the graph, is the object moving faster or slower?)

It is not essential for students to know how to construct the graph of time versus position from the data. They must only interpret the graph at this grade level as illustrating speed, faster speed, slower speed, and stopped motion.

Assessment Guidelines:

The objective of this indicator is to *use* a graph to illustrate the motion of an object; therefore, the primary focus of assessment should be to apply a procedure of using a graph to illustrate of the motion of objects. However, appropriate assessments should also require students to *infer* from the shape of a distance time graph whether an object is moving or not; or *compare* distance-time graphs to determine which object is moving faster.